MSNE 407-408 2014-2015 Syllabus 29Nov2014

INSTRUCTOR: Peter Loos office: MEB 215 ploos@rice.edu
Office hours: after class or by appointment

COURSE INFORMATION: Meets: 9:00-9:50 am MWF in MEB 128

This class is not like most others you have taken. There is no final exam, no textbook, no terminology to memorize, and no equations to derive. Many different topics, tools and ideas will be presented and it is up to you to combine those with your knowledge of materials science to design a useful material, process, or device. You are expected to work hard, find your own resources, engage in effective teamwork, be creative, be analytical, and be an independent engineer to succeed in this class.

Both semesters of this course must be taken in sequence during the same academic year to receive course credit for either.

A design and analysis project will be scheduled for the duration of both semesters. This project is the primary focus of the course. The project's topic will be described in detail at the beginning of the fall semester. Students will be divided into teams, as much as possible, according to their preferences.

A second focus of the course is the ABET General Criterion 3. Student Outcomes per www.abet.org/eac-criteria-2014-2015/ . We will borrow some related course materials from the BIOE/ELEC/MECH/GLHT collaborative capstone course.

A student's responsibilities in this course may be divided into three areas: 1) Lectures and workshops on important topics in design, 2) the design and analysis work, and 3) documentation of that work. Lectures and workshops will occupy about three hours a week. Each student should expect to devote an average of at least 6 hours per week for the fall semester in addition to attending lectures and/or workshops.

Detailed descriptions of the required deliverables will be provided at a later date. Briefly, they will include:

- A weekly meeting of the team with its faculty advisor
- An individual Log Book
- A team Project Binder containing all documentation (reports, presentations, and supporting materials)
- An end-of-semester oral presentation and written report
- A functional prototype that has been tested against design criteria

The course grading will be based on both team and student's overall performance, including the following items. The exact value of each of the components below is left to the discretion of the advisor and will be discussed with each team at the first weekly consultation meeting.

50% Team effort:
- Project Binder (including all documentation)
- End of Semester oral presentation & written report
- Weekly Progress Reports
- Design execution

50% Individual effort:
- Log Book
- Participation in meetings and design activities
- Contribution to the team's success
- Assignments related to the ABET Student Outcomes

Any disputes over grading should be brought to the instructor or project mentor in a timely manner.

Attendance at all lectures is required from all students. Attendance will be taken and results provided to project advisors to be factored into the participation grade.

Honor Code Policy
Students are encouraged to talk to each other, to the instructors, or to anyone else about any assignment in the course that is not specifically designated as pledged.

Goals for this course:

This course is intended to address ABET General Criterion 3. Student Outcomes:
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints...
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

In addition students will acquire specific knowledge regarding one class of materials which is the focus of the project.

RESOURCES:

OEDK Equipment: http://oedk.rice.edu/oedk-resources
OEDK Tech Support: http://oedk.rice.edu/techsupport
Gary Cisneros cisneros@rice.edu MSNE Technician
Compendex/Inspec All fields of Engineering, physics, electronics, etc. Watch this MIT video (3:32).
SciFinder The most comprehensive chemical information database, including articles, patents, conference papers, and theses. View Tutorials. Contact administrator for access.
Web of Science/ Web of Knowledge High impact journal articles in all fields.
Scopus Competitor to Web of Science. Includes all subjects and cited reference searching.
OneMine Full text papers from the Minerals, Metals & Materials Society (TMS), the American Institute of Mining, Metallurgical and Petroleum Engineers (AIME) and more.
MRS Online Proceedings Library Papers from the Materials Research Society (MRS) Symposium. 1980-present.
ASM Materials Information Includes the **ASM Handbooks**, **Alloy Finder**, and other ASM products.
American Society for Testing and Materials: Annual Book of ASTM Standards In print, apparently not online.
ASM Handbook In print, apparently not online.
Binary alloy phase diagrams **from ASM** In print, apparently not online.
CRC Handbook of Chemistry & Physics Searchable data on thousands of materials structure and properties

Several more are listed at the MIT Libraries site: http://libguides.mit.edu/materials

Any student with a disability requiring accommodations in this class is encouraged to contact the instructor after class or during office hours. Additionally, students should contact the coordinator for Disabled Student Services in Allen Center.